



Arkansas Comprehensive Testing, Assessment, and Accountability Program

**RELEASED ITEM**

**BOOKLET**

**GRADE 8**

**AUGMENTED BENCHMARK EXAMINATION**

**April 2013**

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**Arkansas Department of Education**

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The criterion-referenced tests implemented as part of the Arkansas Comprehensive Testing, Assessment, and Accountability Program (ACTAAP) are being developed in response to Arkansas Legislative Act 35, which requires the State Board of Education to develop a comprehensive testing program that includes assessment of the challenging academic content standards defined by the Arkansas Curriculum Frameworks.

As part of this program, all grade 8 students in Arkansas public schools participated in the *Grade 8 Augmented Benchmark Examination* in April 2013.

This Released Item Booklet for the *Grade 8 Augmented Benchmark Examination* contains test questions or items that were asked of students during the April 2013 operational administration. The test items included in Part II of this booklet are some of the items that contributed to the student performance results for that administration.

Students were given approximately two hours each day to complete assigned test sessions during the four days of testing in April 2013. Students were permitted to use a calculator for the mathematics items (both multiple-choice and open-response items), with the exception of mathematics questions 1–8 in this Released Item Booklet (items 1–10 in the test booklet). Students were also supplied with a reference sheet to be used during the mathematics sessions so that all students would have equal access to this information during testing. (See the reference sheet on page 17 of this booklet.) All of the reading, writing, and mathematics multiple-choice items within this booklet have the correct response marked with an asterisk (\*). The open-response questions for reading, mathematics, and the essay prompt for writing are listed with scoring guides (rubrics) immediately following. These rubrics provide information on the scoring model used for each subject, with the scoring model for writing defining the overall curricular and instructional link for that subject with the *Arkansas English Language Arts Curriculum Framework*. The domain scoring model, implemented within Arkansas for a number of years, illustrates the appropriate instructional approaches for writing within the state.

The development of the *Grade 8 Augmented Benchmark Examination* was based on the Arkansas Curriculum Frameworks. These frameworks have common distinct levels: Strands to be taught in concert, Content Standards within each Strand, and Student Learning Expectations within each Content Standard. Abridged versions of the *Arkansas English Language Arts Curriculum Framework—Reading Strand*, *Arkansas English Language Arts Curriculum Framework—Writing Strand*, and *Arkansas Mathematics Curriculum Framework* can be found in Part III of this booklet. It is important to note that these abridged versions list only the predominant Strand, Content Standard, and Student Learning Expectation associated with each item. However, since many key concepts within the Arkansas Curriculum Frameworks are interrelated, in many cases there are other item correlations or associations across Strands, Content Standards, and Student Learning Expectations.

Part III of the Released Item Booklet contains a tabular listing of the Strand, Content Standard, and Student Learning Expectation that each question was designed to assess. The multiple-choice and open-response items found on the *Grade 8 Augmented Benchmark Examination* were developed in close association with the Arkansas education community. Arkansas teachers participated as members of the Content Advisory Committee, for each subject area, providing routine feedback and recommendations for all items. The number of items associated with specific Strands, Content Standards, and Student Learning Expectations was based on approximate proportions suggested by the Content Advisory Committee, and their recommendations were accommodated to the greatest extent possible given the overall test design. Part III of the Released Item Booklet provides Arkansas educators with specific information on how the *Grade 8 Augmented Benchmark Examination* items align or correlate with the Arkansas Curriculum Frameworks to provide models for classroom instruction.

## PART I    Scoring Student Responses to Open-Response Items

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While multiple-choice items are scored by machine to determine if the student chose the correct answer from four options, responses to open-response items must be scored by trained “readers” using a pre-established set of scoring criteria.

The Arkansas Benchmark Rangefinding Committee assisted in the development of the scoring criteria. The committee comprises active Arkansas educators with expertise in math, English, and/or language arts education.

### **Reader Training**

Readers are trained to score only one content area. Qualified readers for Arkansas scoring will be those with a four-year college degree in math, English, language arts, education, or related fields.

Before readers are allowed to begin assigning scores to any student responses, they go through intensive training. The first step in that training is for the readers to read the writing prompt, the math open-response item, or the reading passage and its open-response item as it appeared in the test booklet and to respond—just as the student test takers are required to do. This step gives the readers some insight into how the students might have responded. The next step is the readers’ introduction to the scoring rubric. All of the specific requirements of the rubric are explained by the Scoring Director who has been specifically trained to lead the scoring group. Then, responses (anchor papers) that illustrate the score points of the rubric are presented to the readers and discussed. The goal of this discussion is for the readers to understand why a particular response (or type of response) receives a particular score. After discussion of the rubric and anchor papers, readers practice scoring sets of responses that have been pre-scored and selected for use as training papers. Detailed discussion of the responses and the scores they receive follows.

After three or four of these practice sets, readers are given “qualifying rounds.” These are additional sets of pre-scored papers, and, in order to qualify, each reader scoring responses must score in exact agreement on at least 80% of the responses, and each reader scoring writing responses must score in exact agreement with 70% of the responses in each domain. Readers who do not score within the required rate of agreement are not allowed to score the *Grade 8 Augmented Benchmark Examination* responses.

Once scoring of the actual student responses begins, readers are monitored constantly throughout the project to ensure that they are scoring according to the criteria. Daily and cumulative statistics are posted and analyzed, and the Scoring Director or Team Leaders reread selected responses scored by the readers. These procedures promote reliable and consistent scoring. Any reader who does not maintain an acceptable level of agreement is dismissed from the project.

### **Scoring Procedures**

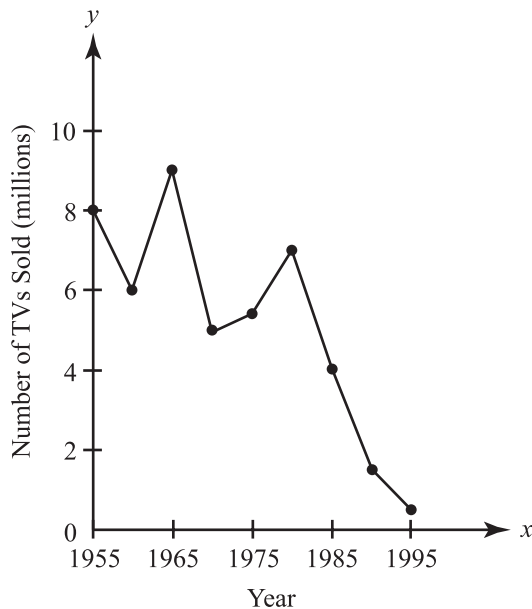
All student responses to the *Grade 8 Augmented Benchmark Examination* open-response test items are scored independently by two readers. Those two scores are compared, and responses that receive scores that are non-adjacent (a “1” and a “3,” for example) are scored a third time by a Team Leader or the Scoring Director for resolution.

CALCULATOR NOT PERMITTED—ITEMS 1–8



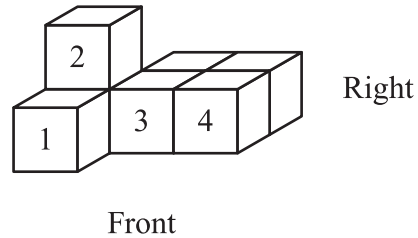
- 1 Which statement **best** represents the pattern of sales of black-and-white TVs as shown in the graph below?

Black-and-White TV Sales (1955–1995)



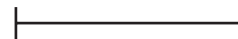
- \* **A** The final decline of sales for black-and-white TVs began in 1980.  
**B** The sales of black-and-white TVs continually decline for 40 years.  
**C** The most drastic decline in black-and-white TV sales was from 1955–1960.  
**D** There was a slight decrease in black-and-white TV sales between 1970–1975.

- 2 The building below is constructed out of 7 blocks.



One additional block needs to be added without changing the front or right side views. Where could the 8th block be added?

- A** on top of block number 1  
**B** on top of block number 3  
\* **C** in front of block number 4  
**D** in front of block number 1
- 3 Which is closest to the length of the line segment below?



- A**  $1\frac{5}{8}$  inches  
**B**  $1\frac{3}{8}$  inches  
**C**  $1\frac{5}{16}$  inches  
\* **D**  $1\frac{3}{16}$  inches

- 4 Look at the table below.

Student	Height	Long Jump Distance
1	63	60
2	65	68
3	59	57
4	65	61
5	61	54
6	62	60
7	64	59
8	63	66
9	66	68
10	68	74

Which type of display would be **most** appropriate to illustrate the distance a person can long jump and his/her height?

- \* **A** scatter plot
  - B** circle graph
  - C** Venn diagram
  - D** box-and-whisker plot
- 5 A football field is 100 yards long from goal line to goal line. Sal ran half the length of the field before he was tackled. How many feet did he run?
- A** 50 feet
  - B** 100 feet
  - \* **C** 150 feet
  - D** 300 feet

- 6 Amahl does computer repairs in his home. He charges a set fee to analyze the problem, plus an hourly rate for his labor. The table below shows  $C$ , the total charge to his customer, based on  $h$ , the number of hours of labor required.

**Customer Charges**

Number of Hours ( $h$ )	Total Charge ( $C$ )
2	\$39
4	\$63
6	\$87

Which equation could Amahl use to determine his customer's total charge?

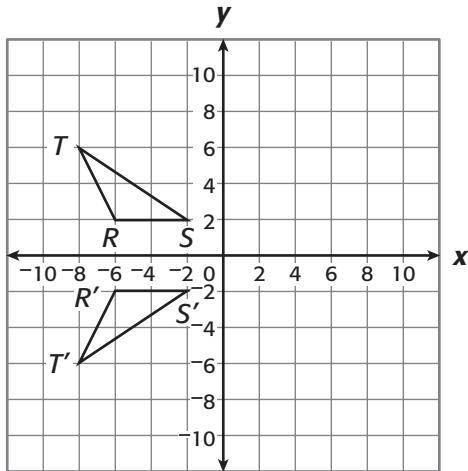
- A**  $C = 9h + 21$
  - \* **B**  $C = 12h + 15$
  - C**  $C = 15h + 9$
  - D**  $C = 24h + 15$
- 7 Which illustrates the multiplicative identity property?
- A**  $a(0) = 0$
  - \* **B**  $a(1) = a$
  - C**  $a\left(\frac{1}{a}\right) = 1$
  - D**  $a(1) = 1$



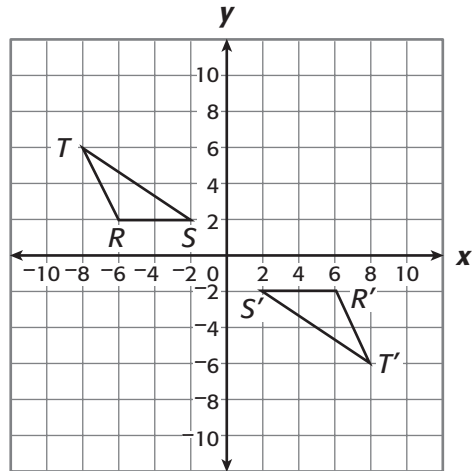
- 8 Triangle  $TRS$  is rotated  $90^\circ$  counterclockwise about the origin to form triangle  $T'R'S'$ .

Which graph shows this transformation?

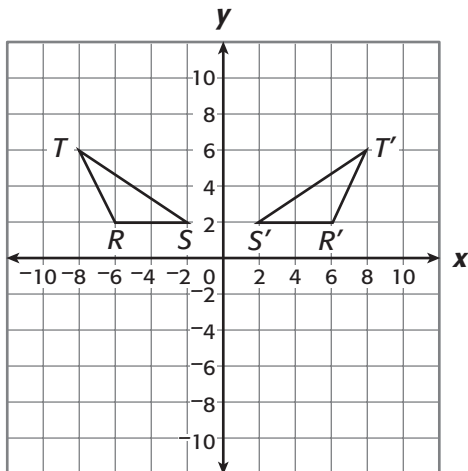
**A**



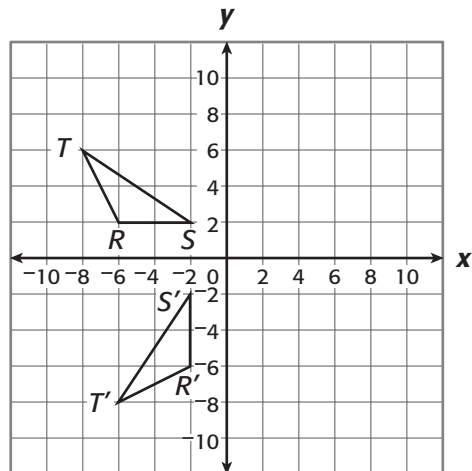
**B**



**C**



**\* D**



## CALCULATOR PERMITTED—ITEMS 9–20 and A–C



**9** Which statement about squares and cubes is true?

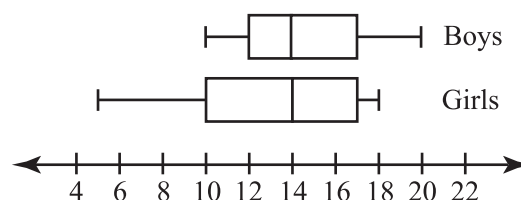
- \* **A** A cube has 2 times as many vertices as a square.
- B** A cube has 3 times as many vertices as a square.
- C** A cube has 6 times as many vertices as a square.
- D** A cube has 12 times as many vertices as a square.

**10** Which description describes the graph of  $f(x) = -x^2 + 4$ ?

- A** a parabola that opens up with vertex at  $(0, 4)$
- B** a parabola that opens up with vertex at  $(0, -4)$
- \* **C** a parabola that opens down with vertex at  $(0, 4)$
- D** a parabola that opens down with vertex at  $(0, -4)$

**11** Boys and girls from Wilson Elementary School were surveyed to find out how many hours they used the computer each week. The results are shown in the box-and-whisker plot below.

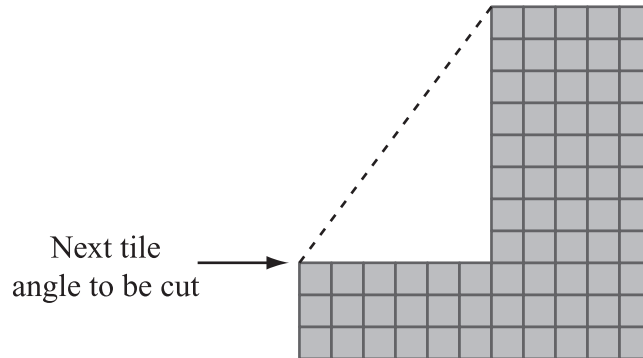
Weekly Computer Hours



What is the **best** conclusion from the data?

- A** The minimum number of hours the boys used the computer is less than the minimum number of hours the girls used the computer.
- B** The median number of hours the girls used the computer is more than the median number of hours the boys used the computer.
- \* **C** The maximum number of hours the boys used the computer is higher than the maximum number of hours the girls used the computer.
- D** The highest number of hours the girls used the computer is more than the highest number of hours the boys used the computer.

- 12** Juan wants to put up a fence bordering the tiled patio shown below in order to create a garden in the shape of a right triangle. Each square tile shown below measures 1 foot per side.



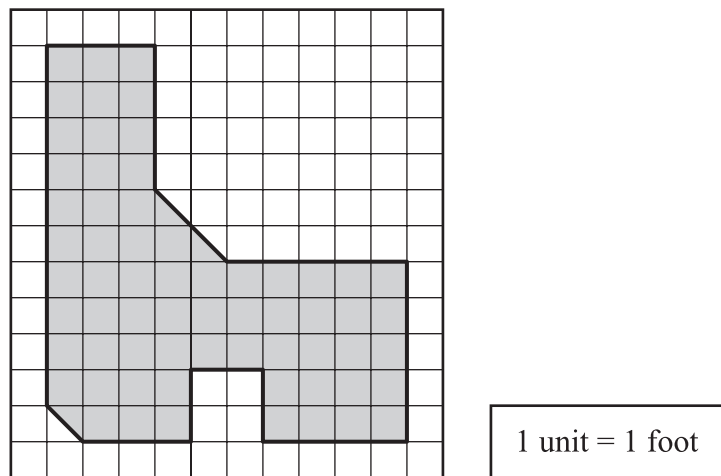
How many feet of fencing does Juan need?

- A** 5  
**\* B** 10  
**C** 14  
**D** 38
- 
- 13** The price of a gallon of gas in one month was \$2.60. The following month, the price was \$2.99. What was the percent increase of the price of gas?
- A** 1.5%  
**B** 13%  
**\* C** 15%  
**D** 39%
- 14** What is the value of  $y$  for the equation shown when  $x = -8$ ?
- $$y = 1.5x - 7$$
- A** -10  
**\* B** -19  
**C** -22.5  
**D** -44

- 15** A data set with 9 pieces of data has a mean of 70, a median of 71, a mode of 71, and a range of 10. If an outlier piece of data, 99, is included, which statement must be true?

\* **A** The mean will increase.  
**B** The range will decrease.  
**C** The mode will become 99.  
**D** The median will not change.

- 16** An odd-shaped bathroom floor to be tiled is shown as the shaded region in the diagram below.



The tile for the floor costs \$1.50 per square foot. How much will it cost to buy exactly the right amount of tile?

**A** \$ 65.50  
\* **B** \$ 98.25  
**C** \$196.50  
**D** \$234.00

- 17** Which is equivalent to

$$10\left(\frac{(2+3)^2}{5}\right) + 4?$$

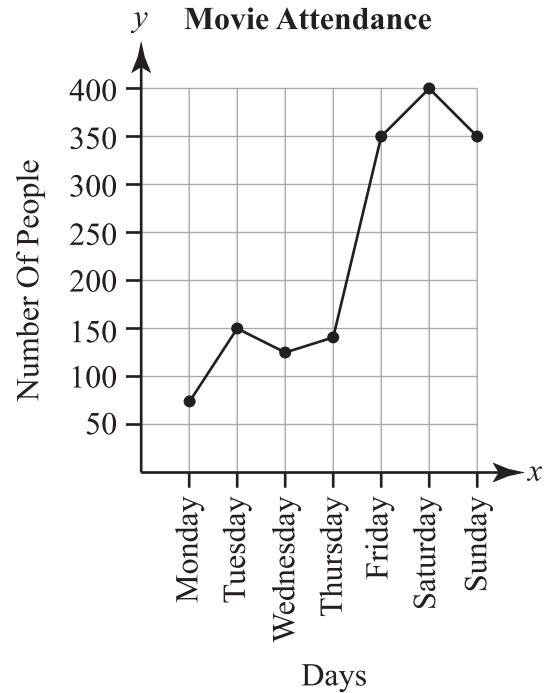
- A** 14
- B** 26
- C** 53
- \* **D** 54

- 18** What is the greatest common factor (GCF) of the two terms shown below?

$$16x^2y \quad 64x^3y^3$$

- A**  $8x^2y$
- B**  $32x^2y$
- \* **C**  $16x^2y$
- D**  $16x^2y^2$

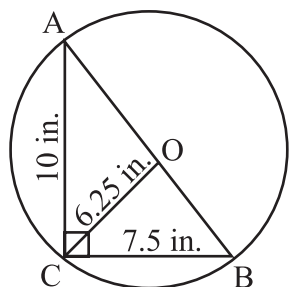
- 19** The graph below shows the number of customers at a local movie theater for one week.



Which measure of central tendency or measure of spread would result in the **lowest** value?

- \* **A** median
- B** range
- C** mean
- D** mode

- 20** What is the perimeter of triangle ABC in the figure below?



- A**  $\sqrt{17.5}$  inches
- B**  $\sqrt{175}$  inches
- C** 18 inches
- \* D** 30 inches

**Mathematics Item A—2013 Grade 8**

- A** Paulo has earned test scores of 87, 81, 82, 94, 89, and 96.
1. What is Paulo’s median test score? Show your work.
  2. What is Paulo’s mean test score? Round your answer to the nearest whole number. Show your work.
  3. Paulo wants to raise his mean score to be at least a 95. If there is only one more test this quarter, and the highest grade possible on a test is 100, can Paulo have a mean score of at least 95? Show your work or explain your response.

BE SURE TO LABEL YOUR RESPONSES 1, 2, AND 3.

**Mathematics Item A Scoring Rubric—2013 Grade 8**

Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 – 3½ points.
2	The student earns 2 – 2½ points.
1	The student earns ½ – 1½ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

## Solution and Scoring

Part	Points
1	<p><b>1 point possible:</b></p> <p>½ point: Correct answer: 88</p> <p><b>AND</b></p> <p>½ point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>            Give credit for the following or equivalent:            Ex. 81, 82, 87, 89, 94, 96</p>
2	<p><b>1 point possible:</b></p> <p>½ point: Correct answer: 88</p> <p><b>AND</b></p> <p>½ point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>            Give credit for the following or equivalent:            Ex. <math>\frac{(81 + 82 + 87 + 89 + 94 + 96)}{6} = 529 \div 6 = 88.\overline{16} \approx 88</math></p>
3	<p><b>2 points possible:</b></p> <p>2 points: Correct answer: No it is not possible  <i>Or correct answer based on Part 2</i>            Correct and complete explanation or work shown            Give credit for the following or equivalent:            Ex. <math>\frac{81 + 82 + 87 + 89 + 94 + 96 + x}{7} \geq 95</math>  <math>529 + x \geq 665</math>  <math>x \geq 136</math></p> <p>Ex. <math>\frac{529 + 100}{7} = \frac{629}{7} \approx 89.857142857</math>, so no</p> <p>Ex. <math>95 \times 7 = 665</math>; <math>665 - 529 = 136</math> so he can't</p> <p><b>OR</b></p> <p>1 point: Correct answer, work is incomplete (some math is shown)            Or            An arithmetic or copy error is present in the work            Or            Correct and complete work shown</p>



<b>Mathematics Item B—2013 Grade 8</b>
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- B** A track coach recorded his runners' times on two different races. The information is in the table below.

Runner	Speed
Adam	50 m/10 s
Felix	200 m/1 min

- What is each runner's speed in km/hr? Show your work.
- Each runner began running in the same direction along a path from the same point. If each runner maintained his speed from Part 1 and ran for 15 minutes, how much distance, in km, would be between them? Show your work.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

<b>Mathematics Item B Scoring Rubric—2013 Grade 8</b>
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Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 – 3½ points.
2	The student earns 2 – 2½ points.
1	The student earns ½ – 1½ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

## Solution and Scoring

Part	Points
1	<p><b>2 points possible:</b></p> <p>½ point: Correct answer: Adam's speed = 18 (km/hr)</p> <p><b>AND</b></p> <p>½ point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>            Give credit for the following or equivalent:            Ex. <math>50 \times 6 = 300</math>; <math>300 \times 60 = 18000</math>; <math>18000 \div 1000 = 18</math></p> <p><b>AND</b></p> <p>½ point: Correct answer: Felix's speed = 12 (km/hr)</p> <p><b>AND</b></p> <p>½ point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>            Give credit for the following or equivalent:            Ex. <math>200 \times 60 = 12000</math>; <math>12000 \div 1000 = 12</math></p>
2	<p><b>2 points possible:</b></p> <p>1 point: Correct answer: 1.5 (km)  <i>Or correct answer based on Part 1</i></p> <p><b>AND</b></p> <p>1 point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>            Give credit for the following or equivalent:            Ex. Adam: <math>0.25 \times 18 = 4.5</math> km            Felix: <math>0.25 \times 12 = 3</math> km  <math>4.5 - 3 = 1.5</math> km            Ex. Adam: <math>18 \times 15 \div 60</math>            Felix: <math>12 \times 15 \div 60</math>  <math>4.5 - 3 = 1.5</math></p>

**Mathematics Item C—2013 Grade 8**

- C** The mean radius of the planet Mercury is  $2.4 \times 10^3$  km.
1. The mean radius of the planet Neptune is approximately 10 times that of Mercury. Estimate the mean radius of Neptune and express the value in scientific notation.
  2. The volume formula for a sphere is  $V = \frac{4}{3}\pi r^3$ . What is the approximate volume of Neptune? Express your answer in scientific notation.
- BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

**Mathematics Item C Scoring Rubric—2013 Grade 8**

Score	Description
4	The student earns 4 points. The response contains no incorrect work. Correct units in Parts 1 & 2.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

## Solution and Scoring

Part	Points
1	<p><b>2 points possible:</b></p> <p>1 point: Correct answer: <math>2.4 \times 10^4</math> km</p> <p><b>AND</b></p> <p>1 point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>            Give credit for the following or equivalent:            Ex. <math>2.4 \times 10^3 \times 10 =</math>            Ex. <math>2400 \times 10 =</math></p>
2	<p><b>2 points possible:</b></p> <p>1 point: Correct answer: <math>5.8 \times 10^{13}</math> km<sup>3</sup>  <math>5.790583579 \times 10^{13}</math> km<sup>3</sup> (<i>using <math>\pi</math></i>)  <math>5.787648 \times 10^{13}</math> km<sup>3</sup> (<i>using 3.14</i>)  <i>Or correct answer based on Part 1</i>  <i>NOTE: Answers may be correctly rounded to any decimal place.</i></p> <p><b>AND</b></p> <p>1 point: Correct and complete explanation or work shown  <i>Work may contain an arithmetic or copy error</i>            Give credit for the following or equivalent:            Ex. <math>V = 4 / 3\pi(2.4 \times 10^4)^3</math>  <math>V = 4 / 3\pi(1.3824 \times 10^{13})</math>  <math>V = 5.8 \times 10^{13}</math> km<sup>3</sup>              Ex. <math>4 \div 3\pi(24000^3)</math></p>

Copying this page is a breach of security.

## Mathematics Reference Sheet Grade 8

*Use the information below, as needed, to answer questions on the Mathematics test.*

<b>Square</b> Area = $s^2$ Perimeter = $4s$	<b>Rectangle</b> Area = $lw$ Perimeter = $2(l + w)$	<b>Triangle</b> Area = $\frac{1}{2}bh$ Perimeter = $a + b + c$
<b>Circle</b> Area = $\pi r^2$ Circumference = $2\pi r$	<b>Parallelogram</b> Area = $bh$ Perimeter = $2a + 2b$	<b>Equilateral Triangle</b>  Perimeter = $3s$
<b>Cube</b>  Volume = $s^3$	<b>Cone</b> Volume = $\frac{1}{3}\pi r^2 h$ Surface Area = $\pi rl + \pi r^2$ Slant Height = $l$	<b>Rectangular Prism</b>  Volume = $lwh$
<b>Pyramid</b>  Volume = $\frac{1}{3}(\text{area of base})h$	<b>Sphere</b> Volume = $\frac{4}{3}\pi r^3$ Surface Area = $4\pi r^2$	<b>Cylinder</b> Volume = $\pi r^2 h$ Surface Area = $2\pi rh + 2\pi r^2$
<b>Miscellaneous Formulas and Conversions</b> Sum of interior angles of a polygon having $n$ sides: $(n - 2)180^\circ$ Slope of (non-vertical) line: $m = \frac{y_2 - y_1}{x_2 - x_1}$ Distance between points on a coordinate plane: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ Midpoint: $\left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right)$		<b>Trapezoid</b> Area = $\frac{1}{2}h(b_1 + b_2)$

1 foot = 12 inches  
1 yard = 3 feet  
1 mile = 5,280 feet

$\pi \approx 3.14$

1 cup = 8 ounces (oz)  
1 pint = 2 cups  
1 quart = 2 pints  
1 gallon = 4 quarts

1 kilogram = 1000 grams  
1 meter = 100 centimeters  
1 decimeter = 10 centimeters  
1 centimeter = 10 millimeters  
1 kilometer = 1000 meters  
1 liter = 1000 milliliters

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## Squirrels That Smell Like Snakes

by Cheryl M. Reifsnyder, Ph.D.

From the trunk of her Volkswagen hatchback, Dr. Barbara Clucas aimed her camera.

Nose a-twitch, a California ground squirrel bounded toward Clucas's bait: a circle of sunflower seeds. A ground squirrel will almost always stop for sunflower seeds. Inside the circle of seeds was a rattlesnake skin.

The squirrel grabbed the skin with both front paws and began to chew. Then it smeared snakeskin-scented saliva onto its fur.

Clucas is a scientist who studies animal behavior—especially squirrel behavior—at the University of California, Davis. How did she get started studying how ground squirrels use snakeskins?

Other researchers had seen chipmunks and mice taking snakeskin baths. One day, Clucas saw a ground squirrel doing the same thing, using a skin left behind by a snake. As a snake grows, from time to time it must shed its skin. That shedding lets a new, larger skin underneath expand and make room for more growth. Clucas watched the ground squirrel chew the skin and then smear a mixture of snake scent and saliva onto its sides, hind legs, and tail.

Why would a squirrel do such a thing? There was only one way to find out. Clucas needed to spy on ground squirrels.

### What Are They Thinking?

- 7 Before Clucas began, she came up with three different educated guesses, or hypotheses, that might explain why squirrels spread snakeskin saliva on themselves.



Dr. Barbara Clucas loves her job: spying on squirrels.

**Idea No. 1:** Snakeskin saliva may protect squirrels from their number one enemy, the Northern Pacific rattlesnake.

If that idea is true, then young squirrels and their mothers (who protect them) should spend the most time smearing snakeskin saliva on themselves. More than a third of squirrel pups are eaten by snakes. (An adult male squirrel will fight an attacking rattlesnake, and that's too much trouble for most rattlesnakes.)

**Idea No. 2:** The smell of snakeskin might make other squirrels think the snake-scented squirrel is tougher.

If this guess is correct, then adult males should spend the most time using snakeskin scent. They are the most likely to fight with one another, and an adult male would get an advantage from seeming tough.

**Idea No. 3:** Maybe something in snakeskin helps get rid of pesky fleas.

If this idea is right, then young squirrels should spend the most time smearing snake scent on themselves. That's because they have more flea troubles than adults have.

Clucas's guesses helped her know what to look for. Then she could figure out which guess might be right. She was ready to start squirrel watching.

Clucas began by trapping squirrels. She used black hair dye to mark each of them.

"We wanted to give them each an individual number," she said, "so we knew their age and their sex and could tell all of the individuals apart." She also found the squirrels' burrows, so she knew just where to set up her experiments.

Next, she placed the bait: a snakeskin staked to the ground outside a burrow entrance. She surrounded the snakeskin with sunflower seeds to get the squirrel's attention. Then she went into the back of her car, set up her camera, and waited.

"When you're in your car, the squirrels can't see you, and so they don't run away," Clucas said.

In most cases, when a squirrel came out of its burrow, it noticed the seeds—and the snakeskin. Clucas could start filming.

Dr. Clucas's videos show squirrels chewing on snakeskins and smearing the snake scent on themselves.

Clucas planned how to record what the squirrels did. She watched each squirrel for 30 minutes, beginning when the squirrel touched the snakeskin.



She explained that scientists use “time sampling” to study behavior. “You have a beeper,” she said. “Every 30 seconds, it goes off and you write down what they’re doing.”

That’s what she did as she watched the ground squirrels. She ended up with 60 pieces of information for each time a squirrel found a snakeskin. She showed that young squirrels and adult females spent about twice as much time applying snake scent as adult males did.

“Even pups who had most likely never encountered a snake—had never even seen the outside world—would do the snake-scent-application behavior,” she said. “It was kind of funny, because although they were doing it, they were falling over and doing it very clumsily.”

### The Idea That Won

The numbers supported only one of her guesses: the squirrels most interested in applying chewed-up snakeskin were those in greatest danger from rattlesnakes, not those with the most fleas and not those who had the most fights with other squirrels.

Clucas’s findings raise more questions. How do rattlesnakes respond to squirrel scent when it’s mixed with rattlesnake scent? If the squirrels are applying an anti-snake disguise, does it work?

Clucas is busy answering these and other questions. “I’m just really fascinated with watching animals,” she said. “It’s something I’ve done all my life.” As a scientist, she’ll keep watching animals and asking smart questions about their behavior.

- 1** What is the definition of the word hypotheses as it is used in paragraph 7?
- A** interests held by a scientist
  - \* **B** suspicions not yet confirmed
  - C** facts already known to be true
  - D** topics that are interesting to study

- 2** The main purpose of the three headings that begin with the words “**Idea No.**” is to
- A** emphasize which of the guesses is correct.
  - B** show how the guesses changed over time.
  - C** argue that one of the guesses is right.
  - \* **D** highlight each of the three guesses.



- 3** Why did Dr. Clucas mark the squirrels with black hair dye?
- A** She wanted to make a count of the number of squirrels in the study.
  - B** The squirrels needed to be made visible to any nearby rattlesnakes.
  - \* **C** She needed a method to track each individual squirrel in the study.
  - D** It was too difficult to see the squirrels among leaves and branches.
- 4** According to the passage, which squirrel groups spent the **most** time applying snake scent?
- A** adult males and adult females
  - B** adult females and young males
  - C** adult males and young squirrels
  - \* **D** adult females and young squirrels
- 5** The author organizes the information in this passage by
- A** listing a number of interesting squirrel behaviors, describing each of them in detail, and explaining why each is important.
  - B** arguing that scientists should spend more time observing squirrels and rattlesnakes in order to better understand their behavior.
  - \* **C** identifying an interesting question about squirrels, describing possible answers, and explaining how the question was answered.
  - D** comparing what scientists in the past have learned about chipmunk behavior with what scientists today are learning about squirrel behavior.
- 6** Based on the information in the passage, Dr. Clucas considers studying squirrels to be
- \* **A** engaging.
  - B** tiresome.
  - C** dangerous.
  - D** frustrating.

**7** The author's purpose in this passage is **most likely** to

- A** persuade readers to spend more time observing wild squirrels.
- \* **B** describe one scientist's research on a specific squirrel behavior.
- C** explain the importance of squirrels in protecting the environment.
- D** reflect on the bonds between a scientist and the squirrels she studies.

**8** Based on information in the passage, Dr. Clucas's next research project will **most likely** focus on

- A** why rattlesnakes prefer eating young squirrels over adults.
- B** how young squirrels learn to protect themselves from fleas.
- C** whether chipmunks apply snake scent for the same reasons as squirrels.
- \* **D** how rattlesnakes respond to squirrel scent mixed with rattlesnake scent.

**Reading Item A—2013 Grade 8**

**A** Describe Dr. Clucas’s experiment, using four steps.

**Reading Item A Scoring Rubric—2013 Grade 8**

<b>Score</b>	<b>Description</b>
<b>4</b>	The response describes Dr. Clucas’s experiment, using four steps.
<b>3</b>	The response describes Dr. Clucas’s experiment, using three steps.
<b>2</b>	The response describes Dr. Clucas’s experiment, using two steps.
<b>1</b>	The response describes Dr. Clucas’s experiment, using one step. <b>OR</b> The response demonstrates minimal understanding of the question.
<b>0</b>	The response is totally incorrect and shows no evidence that the student understands the task. The response may be off topic or completely irrelevant.
<b>B</b>	Blank—No response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

## Hannah and the Birdman

by Roland Smith

Is there really an extinct bird living in Mr. Tanner's back yard?

Things were pretty dull in Hannah Gill's neighborhood until the day Mr. Tanner reported seeing the ivory-billed woodpecker.

Reading the newspaper article about the sighting, Hannah's older brother, Martin, said, "That old coot is loony."

"He is not!" Hannah insisted.

"The ivory-billed woodpecker hasn't been seen for over sixty years!" Martin shot back. "It says so right here. The bird is extinct. That means gone forever. Tanner's just looking for attention."

"Mr. Tanner is . . ." Hannah stopped in mid-sentence and shook her head. She knew better than to argue with Martin, even if he was dead wrong. Which in this case he had to be because there was no one on earth who liked attention less than Mr. Joe Tanner. "I'm going over to talk to him," she said.

Mr. Tanner lived a few blocks from the Gills in a three-story house built by his grandfather over a hundred years before. The Tanner family used to own all of Hannah's neighborhood and a good part of the county, but had sold the land off section by section, piece by piece, until there was only the old house left plus the two hundred acres of swamp behind it. Mr. Tanner lived all alone, except for a yellow-headed parrot, nearly as old as he was, named Felix.

He was known in the neighborhood as The Birdman, but not because of the parrot. On his property were hundreds of birdhouses and birdfeeders. He had them nailed to trees, poles, fence posts—even the sides of his large home were covered with the tiny wooden houses he built in his workshop. And the birds flocked to Mr. Tanner's, which did not please his neighbors. They complained about the noise, their gardens getting eaten, and the mess the birds left behind. To which Mr. Tanner usually replied: "My family sold you the land, but they didn't sell you the air."

One day Hannah found a crow with a broken wing and took it to Mr. Tanner. He repaired the wing, and a few weeks later they set the crow free. Hannah and Mr. Tanner had been friends ever since.

As Hannah walked, she noticed a lot more traffic in the neighborhood than normal for a Sunday morning. The cars were unfamiliar and the drivers were certainly not neighbors. A jeep pulled up next to her and rolled down the window. The driver had a beard and wore a pair of binoculars around his neck. “Do you know where Mr. Joseph Tanner lives?” he asked.

“Just around the corner,” Hannah answered, pointing.

“Thanks!” The man sped away.

Hannah hurried after him. There were at least fifty cars parked in front of Mr. Tanner’s house, including a news van and two police cars. People were milling around his yard, some talking on cell phones, some talking to each other, some scanning the trees in the swamp in back of his house with binoculars.

Hannah wandered through the crowd catching bits and pieces of conversation.

“Tanner never saw no woodpecker . . .”

“I tell you he’s crazy . . .”

“Probably saw a pileated woodpecker. People get them mixed up.”

“He has a parrot you know . . .”

“What if he did see one?”

“He was just putting that reporter on . . .”

“Why doesn’t he come out of the house?”

Hannah looked up at the house and saw a curtain move in one of the ground-floor windows—Mr. Tanner’s workshop. She walked casually over to the side door—Mr. Tanner always left it unlocked—and slipped inside while no one was looking.

Mr. Tanner turned around angrily when she came into the room, but his features softened when he saw who it was. As always, Felix was perched on his shoulder like a feathered ornament. “It’s you,” he said turning back to the window. “Did anyone follow you in?”

“I don’t think so,” Hannah said.

“Look at them,” he said. “Like a bunch of turkey vultures on a carcass.”

“What happened?”

“That reporter from the newspaper came by to talk to me about what it was like around here before all the houses got built. I just mentioned the woodpecker in passing. And wouldn’t you know it, she wrote the whole blame article about me seeing the bird.”

“So, you really saw an ivory-billed woodpecker?” Hannah asked.

“I’ve seen plenty of ivory-bills in my life,” Mr. Tanner answered testily. “When I was a kid they were as common as jays.”

“I mean recently,” Hannah said.

He turned back from the window. “What are they saying down there?”

Hannah told him.

When she finished, Mr. Tanner hobbled over to his workbench with his cane—he had very bad arthritis and some days he could barely walk at all. He pulled one of his many bird books off the shelf above the bench and opened it. “This is a pileated woodpecker,”

he said. “And there are at least three pairs in the swamp.” He turned the page. “And this is an ivory-billed woodpecker.”

The most striking difference between the two birds was their beaks. The pileated woodpecker had a black beak. The ivory-bill’s beak was the color of an elephant’s tusk.

“Where did you see it?” Hannah asked.

“Not it,” Mr. Tanner said. “Them. A pair. The male had a red topnotch and the female’s head was solid black. Just like in the picture.” He flipped back to the picture of the pileated woodpecker. “You can see here that both the male and female pileated have red on their head. So, I know what I saw were ivory-bills.”

“Where did you see them?” Hannah asked.

“Right in my yard,” Mr. Tanner said and sat down in his chair with a heavy sigh.

“What’s the matter?”

“I think they’re still here, but I don’t know which house they’re in. I’ve been trying to find them, but my legs are giving me trouble. And my brain isn’t working the way it used to, either. I lose track of which bird is in which house.” He gave another sigh. “I get all mixed up. I get confused.”

Hannah had noticed this too. About a year ago, Mr. Tanner started drifting off in the middle of conversations. When he drifted back he sometimes seemed startled to see Hannah standing there.

“If I could find the ivory-bills, people wouldn’t think I was so crazy,” Mr. Tanner continued. “But more important, I might be able to save this property.”

“What do you mean?”

Mr. Tanner didn’t answer right away, and for a moment Hannah thought he had drifted off again. A beetle skittered across the sawdust-covered floor, reminding her that she needed to do a little housecleaning for her old friend.

“I’m worried about the birds,” he finally answered. “I’ve been trying to give this property to the state, but they don’t want it. When I die, some developer is going to get a hold of the swamp, fill it with dirt, and build houses on it. What will happen to the birds? Where will they go?”

“That’s terrible,” Hannah said. “But how would finding the ivory-bill help?”

“We don’t have endangered-land laws in this country,” Mr. Tanner explained. “But we do have an endangered-species law. If I could prove there were endangered birds here, the land would be protected forever.”

“Then we’ll just have to find them,” Hannah said.

49 Early the next morning, Hannah started looking for the ivory-bills and quickly discovered what a daunting task finding the birds was going to be. It was no wonder Mr. Tanner had gotten confused. There were no vacancies in the birdhouses. She had to stand beneath each house and wait for a bird to return with food to find out who lived there. She was able to disregard the houses too small to hold ivory-bills, but this still left hundreds of houses and thousands of holes drilled into the surrounding trees where birds had carved out homes of their own.

When she got home that night, covered in mud, exhausted, and her neck sore from looking up all day, she told her family that she was giving up.

“Gills don’t give up,” her father said. “There are no ivory-bills,” Martin said. “We’ll help you,” her mother said.

And the next morning they did, though Martin spent more time arguing than he did looking.

“There goes a starling,” he would say.

“That’s a blackbird,” Hannah corrected. “See the red and yellow on its wings?”

“Prove it,” he’d say.

Hannah would have to open her book and show him the picture.

Eventually, though, Martin stopped arguing with Hannah, and actually started asking her questions.

“What do ivory-bills eat?”

“No one knows for sure,” Hannah answered. “But most ornithologists think they eat insects and larvae.”

“Yuk.”

The Gills saw a lot of birds that first day, and the next day, and the day after. Mr. Tanner sat in his workshop window and gave them advice and encouragement. A week went by, during which they managed to write down the location and occupant of every birdhouse, nest, and tree they could reach, but they did not see an ivory-billed woodpecker.

“I think this might be it,” Mr. Gill finally admitted. The Gills had gathered in Mr. Tanner’s front yard to go over their bird map one last time.

“We’ve checked every birdhouse and tree at least twice,” Mrs. Gill said.

“Maybe those ivory-bills he saw were just passing through,” Martin suggested.

“I guess we better go in and tell him,” Hannah said sadly.

They knocked on the front door, but Mr. Tanner didn’t come to open it. From inside, they heard a distinct and steady thonk . . . thonk . . . thonk. “He must be building more birdhouses,” Hannah said. “He can’t hear us. I’ll go around to the side and get him.”

But Mr. Tanner was not in his workshop. She called for him.

“Up here,” a weak voice replied.

In all the time Hannah had known him she had never seen Mr. Tanner upstairs. With his poor legs he couldn’t negotiate the steps.

“Up here,” he said again.

Thonk . . . thonk . . . thonk. He must be pounding on the floor, Hannah thought. She rushed up the steps two at a time.

“Up here.”

He was not on the second floor. Hannah ran up to the third floor and found Mr. Tanner sitting at the bottom of a set of steep narrow stairs with Felix perched on his bony shoulder.

“Are you all right?” she asked.

“I’m fine,” he said. “I’m fine. I just had to take a rest after my climb.”

Thonk . . . thonk . . . thonk.

The sound was coming from behind the small door at the top of the steps. Mr. Tanner was grinning. “This is the birdhouse,” he said. “Beetles. And just think, I was going to call an exterminator.”

“What are you talking about?”

“They must have come in to eat the beetles,” he said. “Go up the stairs. Be real quiet. You’ll see my trail in the dust. Follow it.”

Hannah climbed the steps. Behind the door was an attic. Before entering she looked back down at Mr. Tanner, who was still grinning. “Go ahead,” he whispered.

Hannah followed Mr. Tanner’s footprints through the dusty furniture, trunks, boxes, and old paintings. The prints ended in front of a pile of wooden crates.

Thonk . . . thonk . . . thonk.

The sound was much louder now. Between the crates was a small gap. She peered through it and stifled a gasp of surprise. Not ten feet away were two of the most beautiful birds she had ever seen. One of them was hammering its ivory-colored bill on the floor and chasing the beetles that emerged from the rotting boards. The other bird was sitting on a nest and beneath her were three downy heads.

**9** Read this sentence from paragraph 49.

Early the next morning, Hannah started looking for the ivory-bills and quickly discovered what a daunting task finding the birds was going to be.

As it is used in this sentence, what does daunting mean?

- \* **A** overwhelming
- B** technical
- C** useless
- D** interesting

**10** When Hannah feels discouraged, her family shows the **most** support by

- \* **A** volunteering to assist her with the search.
- B** informing her that the birds are extinct.
- C** showing her where the birds are nesting.
- D** telling her families don’t give up.



- 11** Why were so many people gathered around Mr. Tanner's house?
- A** They were angry neighbors who wanted him to stop attracting birds.
  - B** They were developers who wanted to purchase his remaining land.
  - C** It was an opportunity to see if their neighbor was going crazy.
  - \* **D** It was a newsworthy event that they wanted to witness.
- 12** According to Mr. Tanner, why did the ivory-billed woodpeckers make their home on his third floor?
- A** It was warmer than the birdhouses.
  - B** They were too big for the birdhouses.
  - \* **C** It had a good food source for them.
  - D** They were able to hide from people.
- 13** According to the passage, which feature **most** clearly distinguishes an ivory-billed woodpecker?
- A** The males and females have red on their heads.
  - B** They prefer swamps to woodland areas.
  - \* **C** Their beaks are the color of elephant tusks.
  - D** They always lay three eggs.
- 14** Which sentence is an opinion expressed in the passage?
- A** "The ivory-billed woodpecker hasn't been seen for over sixty years!"
  - \* **B** "Probably saw a pileated woodpecker."
  - C** "You can see here that both the male and female pileated have red on their head."
  - D** "I lose track of which bird is in which house."
- 15** What is the overall mood of the passage?
- A** complimentary
  - B** playful
  - C** bewildered
  - \* **D** hopeful
- 16** The author **most likely** wrote this passage to
- \* **A** entertain the reader by telling about a girl and her neighbor.
  - B** inform the reader about various endangered birds.
  - C** persuade readers to become environmentalists.
  - D** present to the reader both sides of a controversial issue.

**Reading Item B—2013 Grade 8**

**B** How is the theme of loyalty developed in this passage?

Identify **two** characters who are loyal and use **two** details from the passage to support your response.

**Reading Item B Scoring Rubric—2013 Grade 8**

Score	Description
4	The response explains how the theme of “loyalty” is developed in this passage by identifying two characters that are loyal, and providing two details from the passage for support.
3	<p>The response explains how the theme of “loyalty” is developed in this passage by identifying two characters that are loyal, and providing one detail from the passage for support.</p> <p><b>OR</b></p> <p>The response explains how the theme of “loyalty” is developed in this passage by identifying one character that is loyal, and providing two details from the passage for support.</p>
2	<p>The response explains how the theme of “loyalty” is developed in this passage by identifying two characters that are loyal, but failing to provide any details from the passage for support.</p> <p><b>OR</b></p> <p>The response explains how the theme of “loyalty” is developed in this passage by identifying one character that is loyal, and providing one detail from the passage for support.</p> <p><b>OR</b></p> <p>The response provides at least two details from the passage that demonstrate loyalty.</p>
1	<p>The response identifies one character that is loyal, but fails to provide any details from the passage for support.</p> <p><b>OR</b></p> <p>The response generally explains how the theme of “loyalty” is developed in this passage.</p> <p><b>OR</b></p> <p>The response provides one detail from the passage that demonstrates loyalty.</p> <p><b>OR</b></p> <p>The response demonstrates minimal understanding of the question.</p>
0	The response is totally incorrect and shows no evidence that the student understands the task. The response may be off topic or completely irrelevant.
B	Blank—No response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

1 Read the sentence.

The chef was terrified when he served the meal because his boss was known for being especially \_\_\_\_\_.

Which word **best** completes the sentence above?

- A confusing
- \* B critical
- C generous
- D hungry

2 Which of the following forms of writing is **best** for convincing a dance teacher that her class should compete in a city-wide dance competition?

- A a description emphasizing how exciting last year's dance competition was
- \* B a persuasive letter emphasizing how much the students will learn from competing
- C a short story about a girl who practices hard and wins a dance competition
- D a research report about the history of dance competitions around the world

3 Read the poem.

Retreating on silent stocking  
feet,  
Moonlight gracefully folds herself  
away.  
Gold and silver fingers briefly  
entwine  
As Moon makes way for Dawn.

Which type of figurative language appears in the first line of the poem?

- \* A alliteration
- B assonance
- C hyperbole
- D simile

4 Read the sentence.

The lawyer was tense and her client was tense while waiting for the verdict.

Which is the **best** revision of the sentence above?

- A Both the lawyer and her client, waiting for the verdict while tense.
- B Waiting for the verdict, it was tense for the lawyer and tense for her client.
- \* C Both the lawyer and her client were tense while waiting for the verdict.
- D Waiting for the verdict were the tense lawyer and her client.

**WRITING PROMPT**

Everyone has a special talent. What is your talent?

Before you begin to write, think about your talent. It could be something you do at home like cook, babysit, style hair, or repair cars. It could be something you do really well related to music, art, sports, work, school, or something else. Describe your talent.

Now write an essay describing your special talent. Give enough detail so that the person reading your essay will understand.

**WRITER'S CHECKLIST**

- |   |  |
|---|--|
| <p>1. Look at the ideas in your response.</p> <ul style="list-style-type: none"><li>_____ Have you focused on one main idea?</li><li>_____ Have you used enough detail to explain yourself?</li><li>_____ Have you put your thoughts in order?</li><li>_____ Can others understand what you are saying?</li></ul> <p>2. Think about what you want others to know and feel after reading your paper.</p> <ul style="list-style-type: none"><li>_____ Will others understand how you think or feel about an idea?</li><li>_____ Will others feel angry, sad, happy, surprised, or some other way about your response? (Hint: Make your reader feel like you do about your paper's subject.)</li><li>_____ Do you have sentences of different lengths? (Hint: Be sure you have a variety of sentence lengths.)</li></ul> | <ul style="list-style-type: none"><li>_____ Are your sentences alike? (Hint: Use different kinds of sentences.)</li></ul> <p>3. Look at the words you have used.</p> <ul style="list-style-type: none"><li>_____ Have you described things, places and people the way they are? (Hint: Use enough detail.)</li><li>_____ Are you the same person all the way through your paper? (Hint: Check your verbs and pronouns.)</li><li>_____ Have you used the right words in the right places?</li></ul> <p>4. Look at your handwriting.</p> <ul style="list-style-type: none"><li>_____ Can others read your handwriting with no trouble?</li></ul> |
|---|--|

## Domain Scoring Rubric

### Content (C)

The Content domain includes the focusing, structuring, and elaborating that a writer does to construct an effective message for a reader. It is the creation of a product, the building of a composition intended to be read. The writer crafts his/her message for the reader by focusing on a central idea, providing elaboration of the central idea, and delivering the central idea and its elaboration in an organized text. Features are:

- Central idea
- Elaboration
- Unity
- Organization

### Style (S)

The Style domain comprises those features that show the writer purposefully shaping and controlling language to affect readers. This domain focuses on the vividness, specificity, and rhythm of the piece and the writer's attitude and presence. Features are:

- Selected vocabulary
- Sentence variety
- Tone
- Voice
- Selected information

### Sentence Formation (F)

The Sentence Formation domain reflects the writer's ability to form competent, appropriately mature sentences to express his/her thoughts. Features are:

- Completeness
- Absence of fused sentences
- Expansion through standard coordination and modifiers
- Embedding through standard subordination and modifiers
- Standard word order

### Usage (U)

The Usage domain comprises the writer's use of word-level features that cause written language to be acceptable and effective for standard discourse. Features are:

- Standard inflections
- Agreement
- Word meaning
- Conventions

### Mechanics (M)

The Mechanics domain includes the system of symbols and cueing devices a writer uses to help readers make meaning. Features are:

- Capitalization
- Punctuation
- Formatting
- Spelling

### Scoring Scale

Each domain is scored independently using the following scale.

4 =The writer demonstrates **consistent**, though not necessarily perfect, control\* of almost all of the domain's features.

3 =The writer demonstrates **reasonable**, but not consistent, control\* of most of the domain's features, indicating some weakness in the domain.

2 =The writer demonstrates **inconsistent** control\* of several of the domain's features, indicating significant weakness in the domain.

1 =The writer demonstrates **little** or **no** control\* of most of the domain's features.

\*Control: The ability to use a given feature of written language effectively at the appropriate grade level. A response receives a higher score to the extent that it demonstrates control of the features in each domain.

The application of the scale, using actual student writing, is done with the assistance of a committee of Arkansas teachers, language arts supervisors, and representatives of the Arkansas Department of Education.

### Nonscoreable and Blank Papers

Nonscoreable papers include student responses that are off-topic, illegible, incoherent, written in a language other than English, or too brief to assess. Nonscoreable papers will receive a score of "0." Blank papers indicate no response was written and will be reported as NA (no attempt), which translates into a score of "0."

The Arkansas Mathematics Curriculum Framework\*

Strands	Content Standards	Student Learning Expectations
1—Number and Operations (N)	1. Number Sense: Students shall understand numbers, ways of representing numbers, relationships among numbers, and number systems.	<ol style="list-style-type: none"> <li>Read, write, compare and solve problems, with and without appropriate <i>technology</i>, including numbers less than 1 in <i>scientific notation</i>.</li> <li>Convert between <i>scientific notation</i> and standard <i>notation</i>, including numbers from zero to one.</li> <li>Compare and order <i>real numbers</i> including <i>irrational numbers</i> and find their approximate location on a number line (Use <i>technology</i> when appropriate).</li> </ol>
	2. Properties of Number Operations: Students shall understand meanings of operations and how they relate to one another.	<ol style="list-style-type: none"> <li>Understand and apply the <i>inverse</i> and <i>identity</i> properties.</li> <li>Apply rules (conventions) for <i>order of operations</i> to <i>rational numbers</i>.</li> </ol>
	3. Numerical Operations and Estimation: Students shall compute fluently and make reasonable estimates.	<ol style="list-style-type: none"> <li>Solve, with and without appropriate <i>technology</i>, multi-step problems using a variety of methods and tools (i.e. objects, mental computation, paper and pencil).</li> <li>Use <i>estimation</i> to solve problems involving <i>rational numbers</i>; including <i>ratio</i>, <i>proportion</i>, <i>percent</i> (increase or decrease) then judge the reasonableness of solutions.</li> <li>Apply factorization to find <i>LCM</i> and <i>GCF</i> of <i>algebraic expressions</i>. Ex. <math>4x^2 y^3</math> <math>6xy^2</math> <math>GCF=2xy^2</math> <math>LCM=12x^2y^3</math></li> <li>Solve, with and without <i>technology</i>, real world <i>percent</i> problems including <i>percent</i> of increase or decrease.</li> </ol>
2—Algebra (A)	4. Patterns, Relations, and Functions: Students shall recognize, describe, and develop patterns, relations, and functions.	<ol style="list-style-type: none"> <li>Find the <math>n^{\text{th}}</math> term in a <i>pattern</i> or a <i>function</i> table.</li> <li>Using real world situations, describe <i>patterns</i> in words, tables, pictures, and symbolic representations.</li> </ol>
	5. Algebraic Representations: Students shall represent and analyze mathematical situations and structures using algebraic symbols.	<ol style="list-style-type: none"> <li>Solve and graph two-step <i>equations</i> and <i>inequalities</i> with one <i>variable</i> and verify the reasonableness of the result with real world application with and without <i>technology</i>.</li> <li>Solve and graph <i>linear equations</i> (in the form <math>y=mx+b</math>).</li> <li>Write and evaluate <i>algebraic expressions</i> using <i>rational numbers</i>.</li> </ol>
	6. Algebraic Models: Students shall develop and apply mathematical models to represent and understand quantitative relationships.	<ol style="list-style-type: none"> <li>Describe, with and without appropriate <i>technology</i>, the relationship between the graph of a line and its equation, including being able to explain the meaning of slope as a constant rate of change (rise/run) and <i>y-intercept</i> in real world problems.</li> <li>Represent, with and without appropriate <i>technology</i>, <i>linear</i> relationships concretely, using tables, graphs and <i>equations</i>.</li> <li>Represent, with and without appropriate <i>technology</i>, simple exponential and/or quadratic <i>functions</i> using verbal descriptions, tables, graphs and formulas and translate among these representations.</li> </ol>
	7. Analysis of Change: Students shall analyze change in various contexts.	<ol style="list-style-type: none"> <li>Use, with and without <i>technology</i>, graphs of real life situations to describe the relationships and analyze change including graphs of change (cost per minute) and graphs of accumulation (total cost).</li> </ol>

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The Arkansas Mathematics Curriculum Framework\* (continued)

Strands	Content Standards	Student Learning Expectations
3—Geometry (G)	8. Geometric Properties: Students shall analyze characteristics and properties of 2- and 3-dimensional geometric shapes and develop mathematical arguments about geometric relationships.	<ol style="list-style-type: none"> <li>1. Form generalizations and validate conclusions about properties of geometric shapes.</li> <li>2. Make, with and without appropriate <i>technology</i>, and test <i>conjectures</i> about characteristics and properties between <i>two-dimensional</i> figures and <i>three-dimensional</i> objects. Ex. circle vs. cylinder, square vs. <i>cube</i>.</li> <li>3. Determine appropriate application of geometric ideas and relationships, such as <i>congruence</i>, similarity, and the <i>Pythagorean theorem</i>, with and without appropriate <i>technology</i>.</li> </ol>
	9. Transformation of Shapes: Students shall apply transformations and the use of symmetry to analyze mathematical situations.	<ol style="list-style-type: none"> <li>1. Determine a <i>transformation's line of symmetry</i> and compare the properties of the figure and its <i>transformation</i>.</li> <li>2. Draw the results of <i>translations</i> and <i>reflections</i> about the x- and y-axis and <i>rotations</i> of objects about the origin.</li> </ol>
	11. Visualization and Geometric Models: Students shall use visualization, spatial reasoning, and geometric modeling.	<ol style="list-style-type: none"> <li>1. Using isometric dot paper interpret and draw different views of buildings.</li> </ol>
4—Measurement (M)	12. Physical Attributes: Students shall use attributes of measurement to describe and compare mathematical and real-world objects.	<ol style="list-style-type: none"> <li>1. Understand, select and use, with and without appropriate <i>technology</i>, the appropriate units and tools to measure angles, <i>perimeter</i>, <i>area</i>, <i>surface area</i> and <i>volume</i> to solve real world problems.</li> <li>2. Describe and apply equivalent measures using a variety of units within the same system of measurement.</li> </ol>
	13. Systems of Measurement: Students shall identify and use units, systems, and processes of measurement.	<ol style="list-style-type: none"> <li>1. Draw and apply measurement skills with <i>fluency</i> to appropriate levels of precision.</li> <li>2. Solve problems involving <i>volume</i> and <i>surface area</i> of <i>pyramids</i>, <i>cones</i> and composite figures, with and without appropriate <i>technology</i>.</li> <li>3. Apply proportional reasoning to solve problems involving indirect measurements, scale drawings or rates.</li> <li>5. Estimate and compute the <i>area</i> of irregular <i>two-dimensional</i> shapes.</li> </ol>
5—Data Analysis and Probability (D)	14. Data Representation: Students shall formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.	<ol style="list-style-type: none"> <li>2. Explain which types of display are appropriate for various data sets (<i>scatter plot</i> for relationship between two variants and <i>line of best fit</i>).</li> <li>3. Interpret or solve real world problems using data from charts, <i>line plots</i>, <i>stem-and-leaf plots</i>, <i>double-bar graphs</i>, <i>line graphs</i>, <i>box-and-whisker plots</i>, <i>scatter plots</i>, <i>frequency tables</i> or <i>double line graphs</i>.</li> </ol>
	15. Data Analysis: Students shall select and use appropriate statistical methods to analyze data.	<ol style="list-style-type: none"> <li>2. Analyze, with and without appropriate <i>technology</i>, graphs by comparing measures of <i>central tendencies</i> and <i>measures of spread</i>.</li> <li>3. Given at least one of the measures of <i>central tendency</i> create a data set.</li> <li>4. Describe how the inclusion of <i>outliers</i> affects those measures.</li> </ol>
	16. Inferences and Predictions: Students shall develop and evaluate inferences and predictions that are based on data.	<ol style="list-style-type: none"> <li>1. Use observations about differences between sets of data to make <i>conjectures</i> about the populations from which the data was taken.</li> </ol>
	17. Probability: Students shall understand and apply basic concepts of probability.	<ol style="list-style-type: none"> <li>1. Compute, with and without appropriate <i>technology</i>, probabilities of compound events, using organized lists, <i>tree diagrams</i> and <i>logic grid</i>.</li> </ol>

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**Released Items for Mathematics\***

<b>Item</b>	<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
1	A	4	2
2	G	11	1
3	M	13	1
4	D	14	2
5	M	12	2
6	A	6	2
7	N	2	2
8	G	9	2
9	G	8	2
10	A	6	4
11	D	16	1
12	G	8	3
13	N	3	6
14	A	5	2
15	D	15	4
16	M	13	5
17	N	2	4
18	N	3	4
19	D	15	2
20	M	12	1
A	D	15	3
B	M	13	3
C	N	1	1

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Mathematics items.



**Non-Released Items for Mathematics\***

<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
G	8	2
A	7	1
G	8	1
M	13	2
G	9	1
G	8	1
D	14	3
N	3	3
M	13	3
N	3	2
N	3	6
M	12	1
A	5	4
D	17	1
N	1	2
G	8	3
D	15	3
N	1	3
A	4	1
A	5	1
A	7	1
A	6	1

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Mathematics items.

## PART III Item Correlation with Curriculum Framework—Grade 8

### The Arkansas English Language Arts Curriculum Framework—Reading Strand\*

Content Standards	Student Learning Expectations
9. Comprehension: Students shall apply a variety of strategies to read and comprehend printed material.	<ol style="list-style-type: none"><li>1. Use previewing, activating prior knowledge, predicting content of text, formulating questions, and establishing purposes for reading.</li><li>7. Connect own background knowledge and personal experience to make inferences and to respond to new information presented in text.</li><li>9. Infer mood and theme of text.</li><li>10. Use literary elements and historical context to infer author's intent.</li><li>11. Analyze the literary elements of plot, subplot, and climax, and explain the way in which conflicts are resolved or unresolved.</li><li>13. Distinguish among stated fact, reasoned judgment, and opinion in text.</li><li>15. Identify main ideas and supporting evidence in short stories and novels.</li><li>16. Use the <i>text features</i> to locate and recall information, with emphasis on text organizers.</li><li>17. Determine text structure(s) to enhance understanding.</li><li>18. Organize information, including simple outlining.</li><li>19. Use skimming, scanning, note-taking, outlining, and questioning as study strategies.</li></ol>
10. Variety of Text: Students shall read, examine, and respond to a wide range of texts for a variety of purposes.	<ol style="list-style-type: none"><li>5. Use skimming, scanning, note-taking, outlining, and questioning as study strategies.</li><li>6. Read a variety of literature, including essays and plays.</li></ol>
11. Vocabulary, Word Study, and Fluency: Students shall acquire and apply skills in vocabulary development and word analysis to be able to read fluently.	<ol style="list-style-type: none"><li>10. Use context, structure, denotations and connotations to determine meaning of words and phrases.</li></ol>

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

**Released Items for Reading\***

<b>Item</b>	<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
1	R	11	10
2	R	9	17
3	R	9	19
4	R	10	5
5	R	9	17
6	R	9	7
7	R	9	7
8	R	9	7
A	R	9	18
9	R	11	10
10	R	9	11
11	R	9	7
12	R	9	15
13	R	9	19
14	R	9	13
15	R	9	9
16	R	9	10
B	R	9	9

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the English Language Arts items.

Non-Released Items for Reading\*

Strand	Content Standard	Student Learning Expectation
R	9	9
R	9	15
R	11	10
R	9	16
R	11	10
R	9	18
R	10	6
R	9	1
R	9	7

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the English Language Arts items.

The Arkansas English Language Arts Curriculum Framework—Writing Strand\*

Content Standards	Student Learning Expectations
4. Process: Students shall employ a wide range of strategies as they write, using the writing process appropriately.	<p>7. Revise content for</p> <ul style="list-style-type: none"> <li>• Central Idea</li> <li>• Organization</li> <li>• Unity</li> <li>• Elaboration</li> <li>• Clarity</li> </ul> <p>10. Edit individually or in groups for appropriate grade-level conventions, within the following features:</p> <ul style="list-style-type: none"> <li>• <i>Sentence formation</i> <ul style="list-style-type: none"> <li>• Completeness</li> <li>• Absence of fused sentences</li> <li>• Expansion through standard coordination and modifiers</li> <li>• <i>Embedding</i> through standard subordination and modifiers</li> <li>• Standard word order</li> </ul> </li> <li>• <i>Usage</i> <ul style="list-style-type: none"> <li>• Standard inflections</li> <li>• Agreement</li> <li>• Word meaning</li> <li>• Conventions</li> </ul> </li> <li>• <i>Mechanics</i> <ul style="list-style-type: none"> <li>• Capitalization</li> <li>• Punctuation</li> <li>• Formatting</li> <li>• Spelling</li> </ul> </li> </ul>
6. Conventions: Students shall apply knowledge of Standard English conventions in written work.	<p>6. Apply conventions of grammar with emphasis on the following:</p> <p>Subject-verb agreement</p> <p>Parts of speech</p> <p>Pronoun and antecedent agreement</p> <p>Parts of a sentence and <i>sentence patterns</i></p> <p>S-V</p> <p>S-V-DO</p> <p>S-V-IO-DO</p> <p>S-LV-PN</p> <p>S-LV-PA</p> <p>Conjugation in regular, progressive, and emphatic verb forms</p> <p>Verbals</p> <p>7. Spell words correctly in all writing.</p> <p>9. Apply conventional rules of punctuation in writing.</p>
7. Craftsmanship: Students shall develop personal style and voice as they approach the craftsmanship of writing.	<p>1. Use figurative language purposefully, such as <i>alliteration</i> and <i>assonance</i>, to shape and control language to affect readers.</p> <p>2. Use a variety of <i>sentence types</i> and lengths (see Conventions Standard 6).</p> <p>5. Use purposeful vocabulary with emphasis on developing <i>tone</i>.</p>

\* The Content Standards and Student Learning Expectations listed are those that specifically relate to the released and non-released test items in this booklet.

Released Items for Writing\*

Item	Strand	Content Standard	Student Learning Expectation
1	W	7	5
2	W	5	2
3	W	7	1
4	W	4	7

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Writing items.

**Non-Released Items for Writing\***

<b>Strand</b>	<b>Content Standard</b>	<b>Student Learning Expectation</b>
W	6	7
W	6	9
W	6	6
W	4	10

\* Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Writing items.



**Arkansas Comprehensive Testing, Assessment, and Accountability Program**

**DEVELOPED FOR THE ARKANSAS DEPARTMENT OF EDUCATION, LITTLE ROCK, AR 72201**

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